Probability midterm exam
(Model 1)

Question (1):

(A) Box **I** containing 3 red and 2 blue marbles while Box **II** contains 2 red and 8 blue marbles .A fair coin is tossed. If the coin turns up heads a marble is chosen from Box **I** ;if it turns up tails a marble is chosen from Box **II** find the probability that a red marble is chosen?

(B)How many 4-digit number can be formed with the 10 digits 0,1,2,3,.....,9 if (a)Repetitions are allowed *(b)* Repetitions *are not allowed (c)The last digit must be zero and* Repetitions *are not allowed?*

Question (2):

The joint density function of two continuous random variable X and Y is

$$f(x, y) \;=\; \begin{cases} cxy & 0 < x < 4,\; 1 < y < 5 \\ 0 & \text{otherwise} \end{cases}$$

(a)Find the value of constant C.

(b)Find P $(X \geq 3, Y \leq 2)$.

(c) Find P ($1 < X < 2, 2 < Y < 3$¿.

(d) Find the marginal distribution function of X.

(e) Find the marginal distribution function of Y

Question (3):

(A) If $X^{*}=(X-\mu)\backslash\delta$ is a standardized random variable ,Prove that (a) $E(X^{*})$ =0 ,(b) Var (X^{*})=1 ?

(B) suppose that the two random variable X and Y have joint density function for :

$$f(x, y) \;=\; \begin{cases} xy/96 & 0 < x < 4,\; 1 < y < 5 \\ 0 & \text{otherwise} \end{cases}$$

Find (a) E(X), (b) E(Y) ,(c) E(XY), (d) E(2X+3Y) .